

ABSTRACT

Title

The genetic predisposition of a speed ability among the players of the 1st and 2nd Czech football league.

Study aim

To determine the impact of *ACE* I/D, *ACTN3* R577X, *AMPD1* Gln12X, *BDKRB2* 9/+9, *IL1RN* VNTR, *NOS3* Glu298Asp, *UCP2* Ala55Val polymorphisms genotype frequencies on the results of the speed ability motor tests.

Methods

DNA samples obtained from epithelial mouth were quantified and analyzed using the PCR method from 106 football players of the 1st and 2nd Czech football league (age $25,3 \pm 4,69$; weight $77,5 \pm 7,33$; height $181,2 \pm 6,23$). Genotype frequencies were estimated for the *ACE* I/D, *ACTN3* R577X, *AMPD1* Gln12X, *BDKRB2* 9/+9, *IL1RN* VNTR, *NOS3* Glu298Asp, *UCP2* Ala55Val polymorphism. Motor speed ability was tested by the vertical jump height, produced power and power impulse for the countermovement jump, countermovement jump without arms swing and squat jump. Isokinetic maximal power of flexors and extensors of the knee were tested at the angle speed $60^{\circ} \cdot s^{-1}$, $180^{\circ} \cdot s^{-1}$, $300^{\circ} \cdot s^{-1}$. χ^2 test (Pearson's chi-square test) was used to determine the genotypes difference for the parameters of the motor speed ability tests in the football players who exceeded 80th percentil compare to the other football players. Kruskal-Wallis test was used to determine dependence ($p = 0,05$) of the genotypes frequencies for the results of the motor speed ability tests.

Results

All examined gene polymorphism were in the Hardy-Weinberg equilibrium (HWE), $p > 0,05$. χ^2 test results confirmed statistically significant difference for genotype frequencies of *ACTN3* R577X ($\chi^2=4,632$) and *BDKRB2* -9/+9 ($\chi^2=4,76$) for the squat jump maximal power ($2,19 \pm 0,14$ N.kg⁻¹) and the squat jump impulse ($2,76 \pm 0,23$ N.s.kg⁻¹) for the football players who exceeded 80th percentil compared to other football players.

We found out the statistical difference between Val/Val genotype and Ala/Ala ($p=0,027$), Ala/Val ($p=0,010$) genotype of *UCP2* Ala55Val for the squat jump height.

Key words

sports performance, sprint, sport genetics, sport predisposition, heredity